

A Guide to NAS-SYS

workspace location \$UOUT+1 (0C78/9). The start address of the users input routine must be placed in \$UIN+1 (0C7B/C). These locations are initialised by NAS-SYS to point to a RET instruction, so that if these locations are not changed, the U command has no effect.

The U command is automatically suspended during the execution of the G,R,V, and W commands.

The N command (which see) changes the input/output tables so to exclude user-written routines.

For an example of a user-written output routine see Chapter 4.13.

VERIFY TAPE COMMAND

```
V
SCAL "V
SCAL 56H
RST 18H:DEFB 56H
DF 56
```

The Verify Tape command simply reads a cassette tape in the same manner as the R command (which see) but does not enter the data into memory.

The command is used to check that a tape can be read without error.

WRITE COMMAND

```
W xxxx yyyy
SCAL "W
SCAL 57H
RST 18H:DEFB 57H
DF 57
```

The Write command is used to write data to a cassette tape. Data from memory locations xxxx to yyyy-1 inclusive are transmitted from the serial port. Note that, because all the serial outputs are physically connected, the data is also transmitted to the RS232 output and the 20mA output at the same time.

The data is transmitted in blocks of 256 bytes, except for the last block which may have fewer bytes. The format of each block is:

00	Nul
FF FF FF FF	Four start-of-block characters
SL SH	Start address, low byte first
LL	Number of data bytes in this block, (00=256)
BB	Block number: decrements to zero for each succeeding block
CC	Checksum for the header data
data bytes	Normally 256 bytes
EE	Checksum for the data bytes

00 (x10) Ten nul characters

As each block is transmitted, the following data is displayed:

SSSS BBLL

where SSSS = the memory address of the first
 byte of the block being transmitted
 BB = the block number: the last block
 is numbered 00
 LL = the number of bytes in the data
 block:00=256

At the beginning of the Write command, the tape led is illuminated, there is a brief delay, and 256 nul characters (00) are transmitted. The overall format of the tape is thus:

00 (x 256) 256 nuls
Block n
Block n-1
...
...
...
Block 1
Block 0

EXTERNAL SERIAL DEVICE COMMAND

X xx
SCAL "X
SCAL 58H
RST 18H:DEFB 58H
DF 58

The External serial device command places xx into workspace location \$XOPT and sets the start of the input table to INTX (NAS-SYS 3) and the start of the output table to OUTTX. The input table is thus XKBD and RKBD while the output table is XOUT, UOUT, and CRT. See Chapter 1.4.

The device handlers XOUT and XKBD (see chapter 3) allow both the incoming and the outgoing data via the serial input and output ports to be modified slightly so as to meet the requirements of various external serial devices such as a VDU, printer, or a mainframe computer. Thus, for example, the parity of the output data may be set to either odd or even, and a line feed character may be automatically inserted after a carriage-return.

The characteristics of the serial link are determined by the individual bits in xx, as follows:-

Bit 0	0	Output characters have even parity.
	1	Output characters have odd parity.
Bit 1	0	If input character is CR, bit 4 determines whether or
NAS-SYS 3		not LF is output. Also, any character, other than NUL
only.		and ESC, will not be output by the next call to the
		output routine, XOUT.

- 1 If input character is CR, LF is not output, and the next call to the output routine, XOUT, will produce an output.
- Bit 4 0 If CR is output then output LF. If bit 1=0 and bit 4=0 and input character is CR, then output LF.
1 If CR is input or output do not output LF.
- Bit 5 0 All input characters are echoed with parity determined by bit 0.
1 Input characters are not echoed.
- Bit 7 This bit is used by XKBD to determine whether or not a subsequent call to XOUT will actually output a character.

Some examples:

XX	Characteristics
22	Bits 5 and 1 set. Input characters are not echoed, bit 5 =1. An output CR is automatically followed by an output LF, bit 4=0. Output parity is even, bit 0 =0.
23	Bits 5, 4, and 0 set. As for 22 but odd parity, bit 0=1.
32	Bits 5, 4, and 1 set. As for 22 but an output CR is not followed by a LF, bit 4=1.
33	Bits 5,4,1,and 0 set. As for 32 but odd parity, bit 0=1.
20	Bit 5 set. Input characters are not echoed, bit 5=1. Follow a CR with a LF, bit 4=0. Suppress output via XOUT of all characters other than NUL and ESC, bit 1=0. Output parity is even, bit 0=0.
21	Bits 5 and 0 set. As for 20 but odd parity, bit 0=1.
30	Bits 5 and 4 set. As for 20 but LF not output after CR, bit 4=1.
31	Bits 5,4, and 0 set. As for 30, but odd parity, bit 0=1.

For a detailed description of XKBD and XOUT, see chapter 3.

JUMP TO 8000H
(NAS-SYS 3 only)

Y
SCAL "Y
SCAL 59H
RST 18H:DEFB 59H
DF 59

The Y command simply starts executing the code at location 8000H.

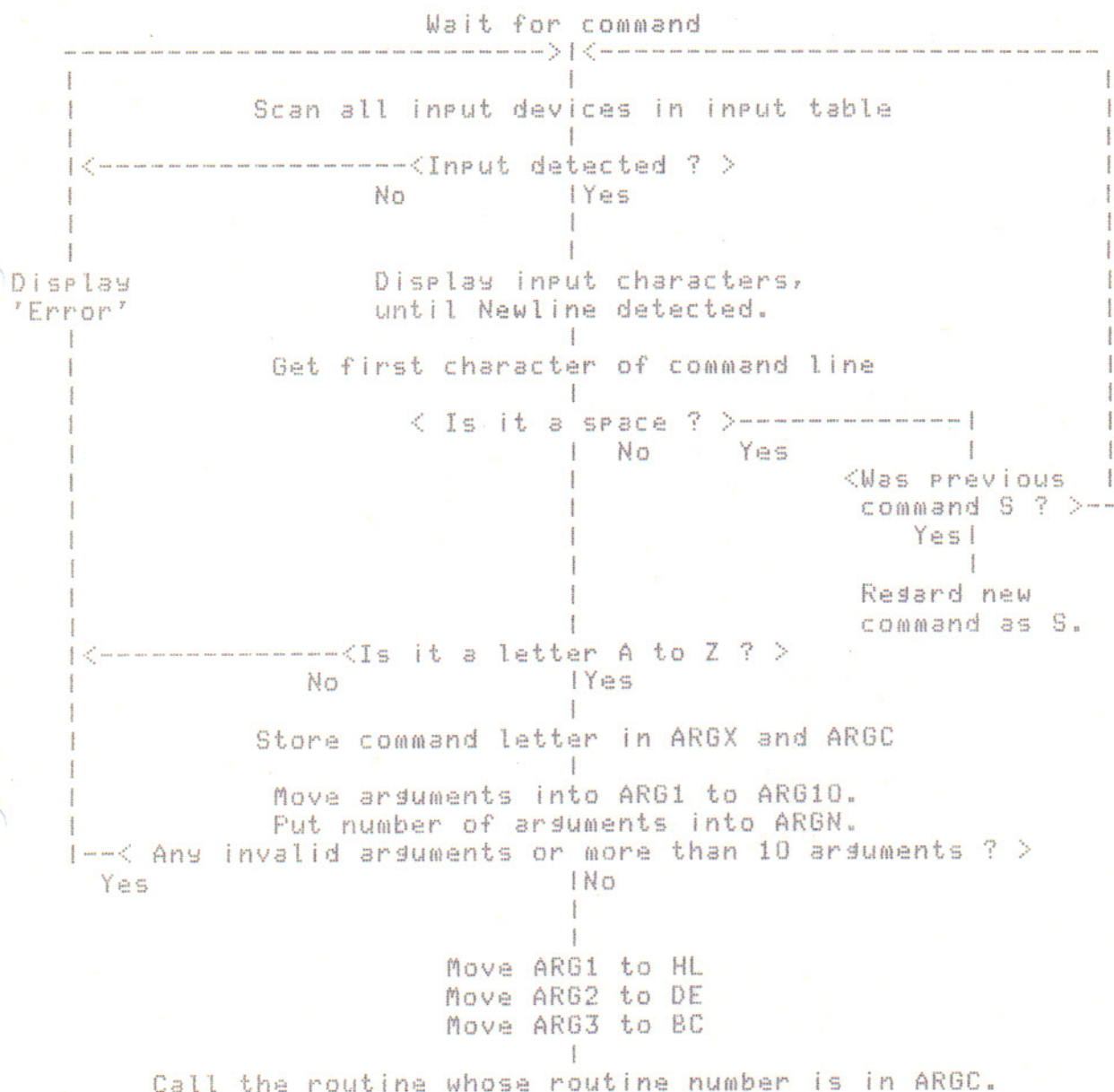
JUMP TO FFFDH

Z
SCAL "Z
SCAL 5AH
RST 18H:DEFB 5AH
DF 5A

The Z command simply starts executing the code at location FFFDH. This is the warm start entry point for 8K ROM BASIC. See also the J command.

2.2 Waiting for commands

When NAS-SYS is blinking the cursor and waiting for a command, it is executing the procedure shown below:



2.3 Commands within a user program

Commands may be called within a user program by coding the instructions shown at the beginning of the description of the command in Section 2.1. If the command has arguments these must be entered into appropriate registers before calling the command. The first argument must be placed in register pair HL, the second argument in register pair DE, and the third argument in register pair BC. Some commands also require that the arguments be stored